

REMARKS

By this amendment, and in conjunction with the Request for Continued Examination (RCE) filed herewith, Applicants have amended claim 25 and claims 26-47 have been added as described further below. Claims 1-17 and 19-24 have been cancelled without prejudice and thus claims 25-47 are currently under examination in the present application. For the reasons set forth below, Applicants submit that the present amendments and arguments place this application in condition for immediate allowance.

As an initial matter, Applicants respectfully submit that the present amendments to claim 25 and the addition of claims 26-47 is proper and should be entered as no new matter has been added by these amendments. In particular, claim 25 has been amended to place this claim into independent form, such that it now refers to a method of using quantum dots in preparing a makeup composition. Previously, claim 25 referred to a "method for preparing a composition according to claim 1" and claim 1 previously referred to a "makeup composition comprising...quantum dots." Further, claim 1 has also been amended to indicate that the makeup composition is colored and that the quantum dots have a core-shell structure and a mean size of 1.5 to 50 nm. Support for these amendments can be found for example, on pages 3-5 of the application, as filed. Finally, new claims 26-47 merely present limitations that were previously found in claims 2-17 and 19-24, which previously depended from claim 1, but which have now been canceled without prejudice. Accordingly, no new matter has been added by the present amendments.

In the Final Rejection dated November 28, 2008, the Examiner made several minor objections to the wording of claims 8 and 9 as there appeared to be a typographical error in reciting the semiconductor groups. This objection has now been rendered moot by virtue of the present amendments cancelling claims 8 and 9, and the removal of those errors in claims 32 and 33, which incorporate the limitations previously presented in claims 8 and 9. In the present set of claims, new claim 32 refers to a semiconductor of groups II-VI and claim 33 refers to a semiconductor of groups III-V. Furthermore, an additional typographical error in the limitation previously presented in claim 10 has been corrected such that new claim 34 now refers to a semiconductor of group IV. Accordingly, Applicants respectfully request that the Examiner's objections to the wording of the claims be withdrawn.

In the Final Rejection, the Examiner rejected claims 1-6 and 22-25 under 35 U.S.C. §102(b) as being anticipated by Nearn, et al. (U.S. 5,417,961). In particular, the Examiner asserted that Nearn discloses cosmetic compositions comprising zinc oxide (ZnO) and, in the Advisory Action dated April 6, 2009, further asserted that, because ZnO particles are known as quantum dots, the methods of using the quantum dots recited in the present application would be obvious in light of the compositions of Nearn. For the reasons set forth below, Applicants submit that this rejection, insofar as applied to the present claims, is respectfully traversed and should be withdrawn.

As reflected in the amended claims, the present invention relates to a method of using quantum dots in preparing a makeup composition that includes providing quantum dots with a mean size of 1.5 to 50 nm and introducing them into a cosmetic

vehicle. While the Examiner recognized that Nearn did not explicitly teach a method of preparing a makeup composition, the Examiner asserted that Nearn discloses ZnO nanoparticles being introduced into an oil phase and an aqueous phase and that this would read on the presently-claimed methods.

Contrary to the Examiner's assertions, however, Nearn does not teach or even remotely suggest a method of preparing a makeup composition that makes use of quantum dots with a size of 1.5 to 50 nm, as recited in claim 25 of the present application. Instead, Nearn describes sunscreen compositions using finely dispersed ZnO particles that are added as a sunscreen agent and only exemplifies the use of ZnO particles with a size of 100 nm. As recognized by those of ordinary skill in the art, sunscreen agents prevent sunburn by reflecting or absorbing visible or UV light. However, as described in U.S. Patent No. 5,032,390, which is referenced by the cited Nearn reference with respect to the use of ZnO particles as sunscreen agents, ZnO particles with a size under 70 nm become transparent to visible and UV light. As such, Nearn does not teach or suggest the use of particles with a size under 70 nm in a composition as these particles would necessarily be expected to have poor light absorbing properties.

Furthermore, as set forth in the attached Declaration of Benoît Dubertret, quantum dots are used as pigments in the present methods due to their smaller size which presents properties that are not shown by larger particles, such as those described in Nearn. Indeed, quantum dots are semiconductor particles having size dependent properties which differ from the bulk values as a result of quantum

confinement. Quantum dots have a diameter smaller than the Bohr radius of the electron, and thus these differ greatly from bulk particles with larger particle size that do not have size-dependent properties. Accordingly, since Nearn only discloses bulk particles which do not have the properties of the quantum dots of the present invention, Nearn does not disclose or make obvious the present claims.

Finally, Nearn does not include a single reference to quantum dots whatsoever. The Examiner has asserted in previous Office Actions, and in the Advisory Action dated April 6, 2009, that Lee (U.S. 2003/0066998) teaches that all zinc oxide particles are quantum dots; however, this is not necessarily the case. Lee describes quantum dots that may comprise zinc oxide, but it does not teach or suggest that any ZnO particles are quantum dots. Indeed, Lee clearly refers to quantum dots as particles with size dependent properties along three orthogonal dimensions. As such, ZnO particles that do not have these dimensions would not be considered quantum dots. As set forth in the attached Declaration of Benoît Dubertret, size dependent properties are observed for particles with a size lower than the Bohr Radius, which is not the case with regard to the particles disclosed in Nearn. Nearn does not disclose particles with size dependent properties, and thus the particles of Nearn could not be used as the quantum dots of the claimed method.

Applicants thus submit that the present claims are not anticipated or rendered obvious by the cited Nearn reference, and that the Examiner's rejection on the basis of this reference is respectfully traversed and should be withdrawn.

In the Final Rejection, the Examiner then rejected claims 1, 6-9, 13-15, and 22-25 under 35 U.S.C. §102(e) as being anticipated by Chen (U.S. 2002/0127224). In particular, the Examiner asserted that Chen discloses topical compositions comprising quantum dots that are similar to the compositions used in the presently-claimed methods, and that these topical compositions could be used in a cosmetic product. For the reasons set forth below, Applicants submit that this rejection is respectfully traversed and should be withdrawn.

In contrast to the claims of the present application, as amended, Chen describes the use of quantum dots in photodynamic therapy whereby quantum dots are irradiated with light of an appropriate wavelength and then reemit light of a different wavelength to allow a photodynamic therapy drug to form an active species, such as one with a singlet oxygen. Although, Chen discloses that the quantum dots used in this photodynamic therapy can be applied to the skin as ointments, creams, or gels, there is no teaching or suggestion in Chen whatsoever regarding the use of quantum dots in a method of preparing a makeup composition, such as what is described and claimed in the present application.

The compositions disclosed in Chen are topical compositions that can not automatically be equated with cosmetic compositions. Indeed, as one of ordinary skill in the art would recognize, therapeutic compositions routinely differ from cosmetic compositions because they contain ingredients that are not recommended for cosmetic applications, such as pharmaceutically active ingredients. As such, Chen does not teach even remotely suggest the preparation of a makeup composition, much less teach

or suggest the preparation of a makeup composition that makes use of quantum dots to provide color to the makeup composition. Accordingly, Applicants submit that the Examiner's rejection is respectfully traversed and should be withdrawn.

In the Final Rejection dated November 28, 2008, the Examiner further rejected claims 2-5 under 35 U.S.C. §103(a) as being unpatentable over Chen, and also rejected claims 10-12, 16, 17, and 19-21 under 35 U.S.C. §103(a) as being unpatentable over Chen in view of Bawendi, et al. (U.S. 6,319,426). Although these rejections have now been rendered moot by virtue of the present amendments cancelling claims 1-17 and 19-24, for the reasons set forth below, Applicants respectfully submit that the cited Chen and Bawendi references fail to render obvious the claims of the present application, as amended. Accordingly, Applicants respectfully submit that the Examiner's rejections are respectfully traversed and should be withdrawn.

As set forth above in relation to the Examiner's rejection of the claims as being anticipated by Chen, it is indeed the case that Chen does not teach or even remotely suggest the preparation of cosmetic compositions, much less the preparation of makeup compositions as described and claimed in the present application. Chen describes topical compositions that use quantum dots in a completely different manner. In Chen, the quantum dots in the topical compositions are used for photodynamic therapy where they are irradiated to cause them to emit light and release a singlet oxygen from a photodynamic therapy drug. As such, when these quantum dot containing topical compositions are used, the compositions are irradiated using artificial light sources, such as LEDs or lasers.

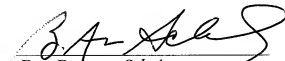
In contrast to Chen, in the presently-claimed methods of using quantum dots in a makeup composition, the coloration of the compositions occurs under natural light without the aid of any artificial light sources. Furthermore, as described in the attached Declaration of Benoît Dubertret, it was unexpected that the quantum dots used for coloration in the present methods could be included in makeup compositions without loss of fluorescence. Chen does not include any teaching or suggestion regarding the coloration of its topical compositions and certainly does not teach or suggest that quantum dots would be useful or stable in such a composition over a period of time. As such, it would simply not be obvious to one of ordinary skill in the art in light of the teachings of Chen that quantum dots could be used as a stable component in preparing a makeup composition. The Bawendi reference adds nothing further in this regard and was merely cited by the Examiner for its teachings with respect to semiconductors having a core-shell structure.

Accordingly, in light of the foregoing comments, Applicants respectfully submit that the claims of the present application, as amended, are not rendered obvious by the cited references and that the claims of the present application are clearly patentable over those references. Thus, Applicant submit that the Examiner's rejection is respectfully traversed and should be withdrawn.

In light of the amendments and arguments provided herewith, Applicants submit that the present application overcomes all prior rejections and objections, and has been placed in condition for immediate allowance. Such action is respectfully requested.

Respectfully submitted,

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